

Evaluation of Chinook Salmon Fry Survival in Lookout Point Reservoir, Western Oregon, 2017 and 2018

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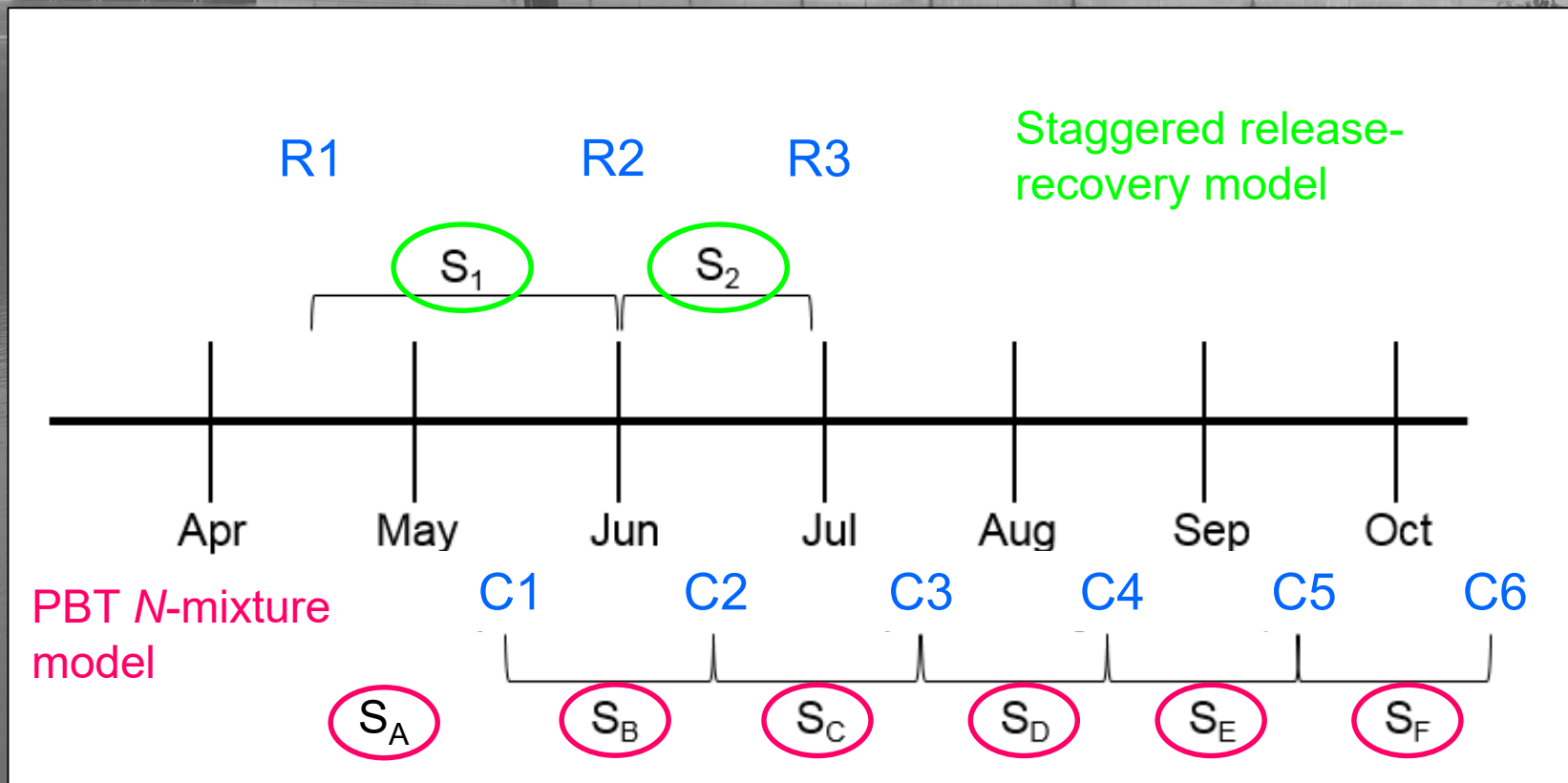
¹U.S. Geological Survey

²Oregon State University

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Study Design



Fish Releases

2017

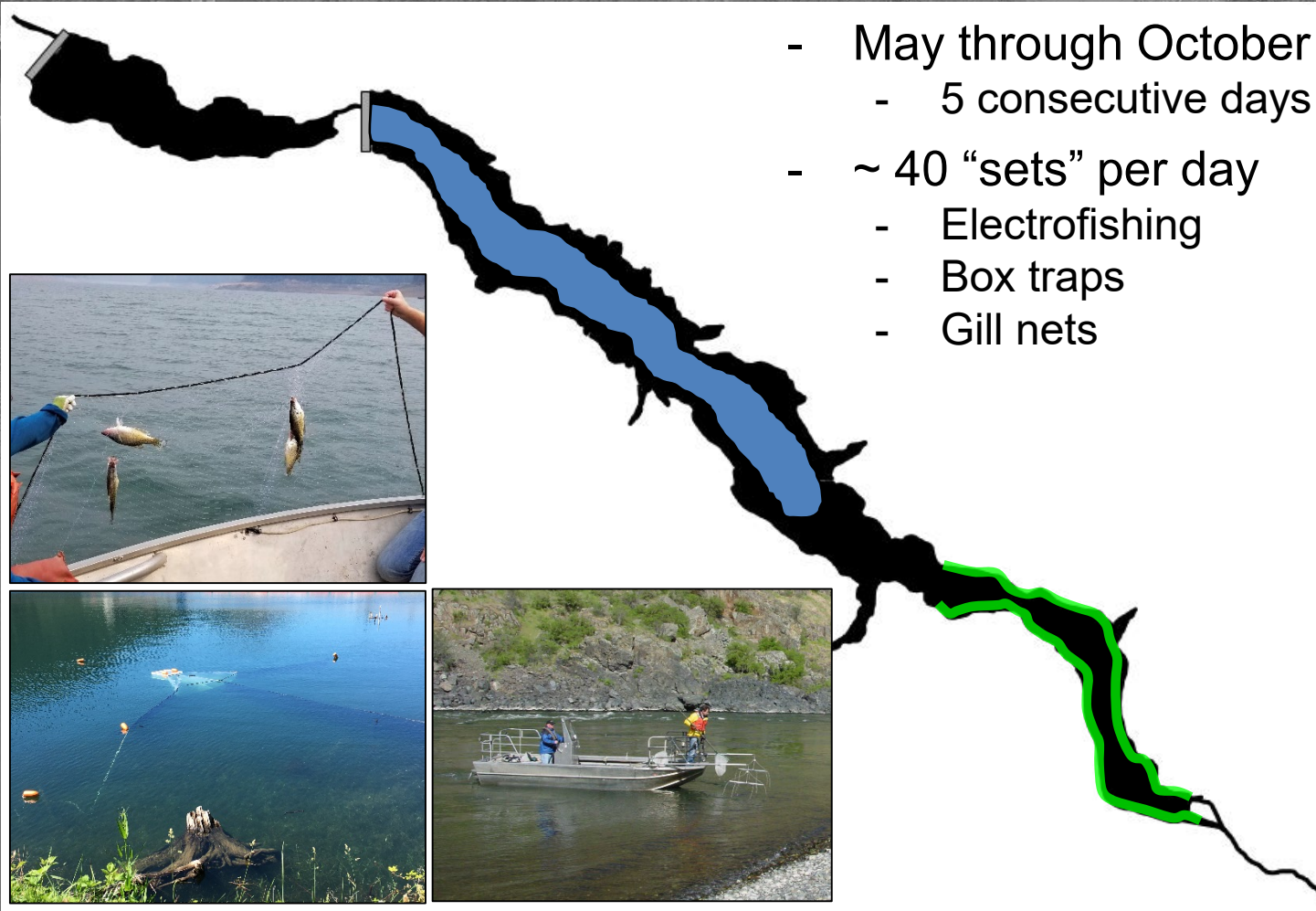
Release	Dates	Number released	Mean fork length
R ₁	April 18-19	43,949	42 mm
R ₂	May 30-June 2	44,147	94 mm
R ₃	June 28	3,920	107 mm

2018

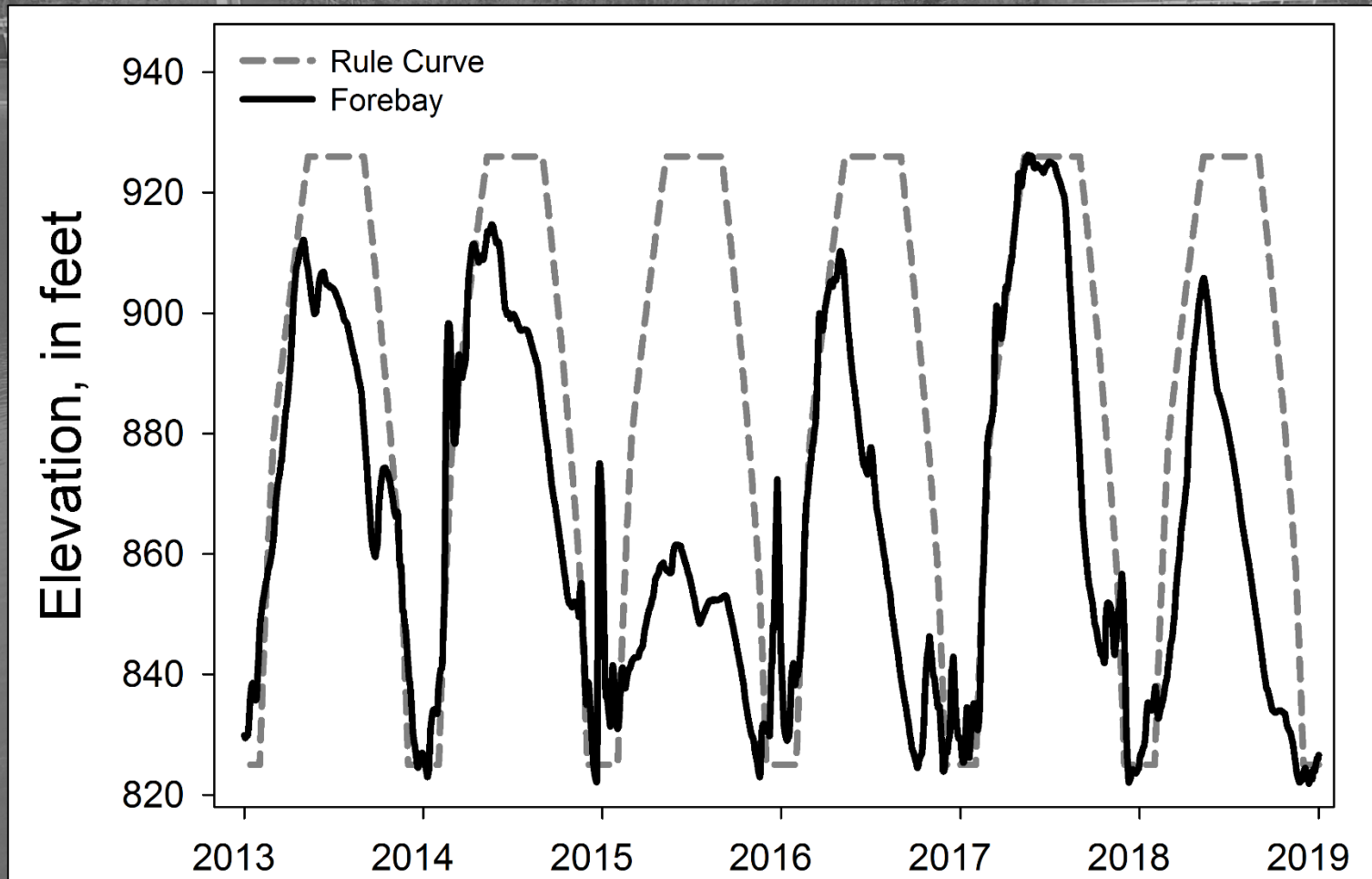
Release	Dates	Number released	Mean fork length
R ₁	April 10-13	119,272	44 mm
R ₂	May 15-18	32,432	90 mm
R ₃	June 18-19	12,129	92 mm

Fish Sampling

- May through October
 - 5 consecutive days
- ~ 40 “sets” per day
 - Electrofishing
 - Box traps
 - Gill nets



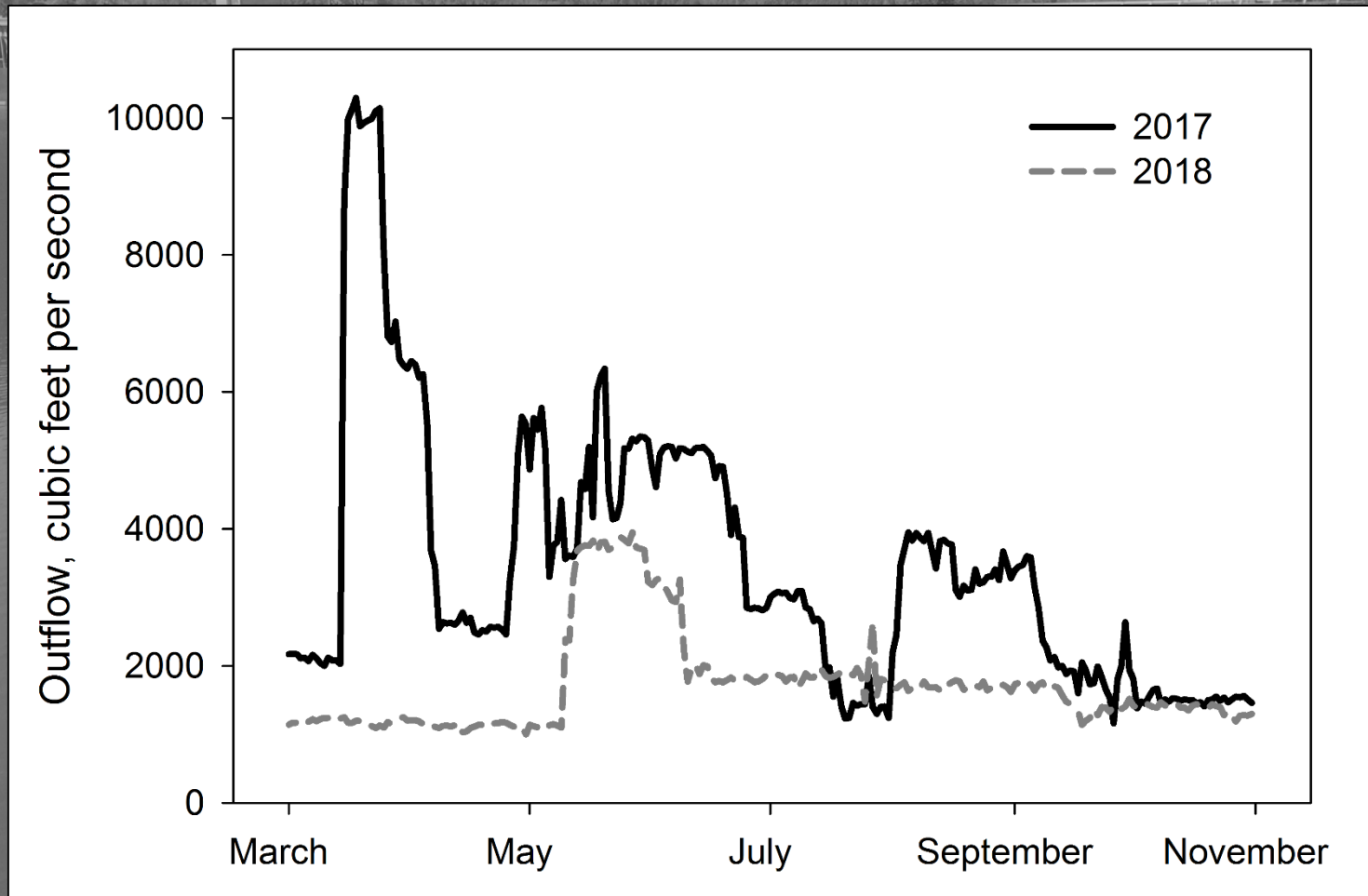
Reservoir Elevation



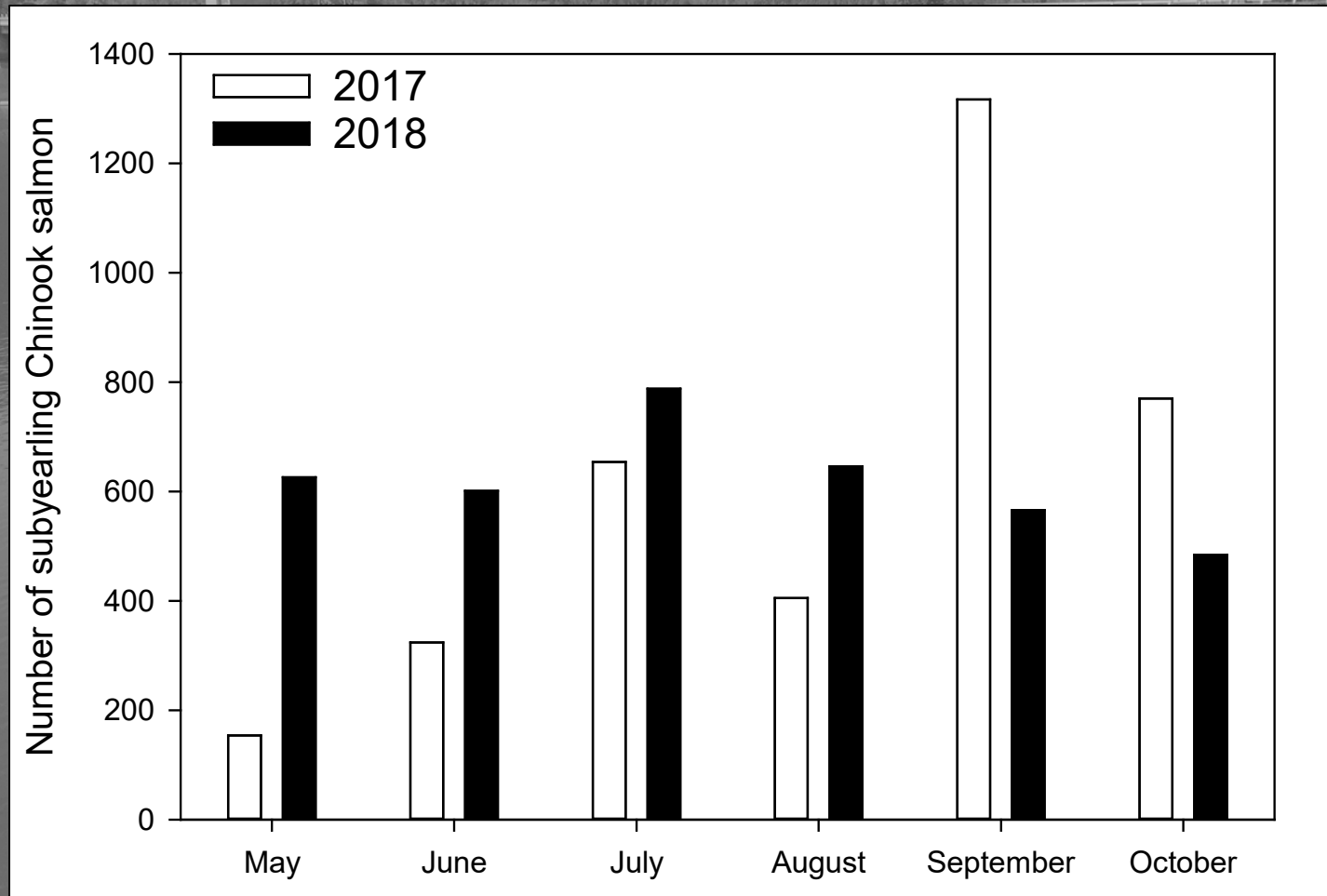
Shoreline Conditions



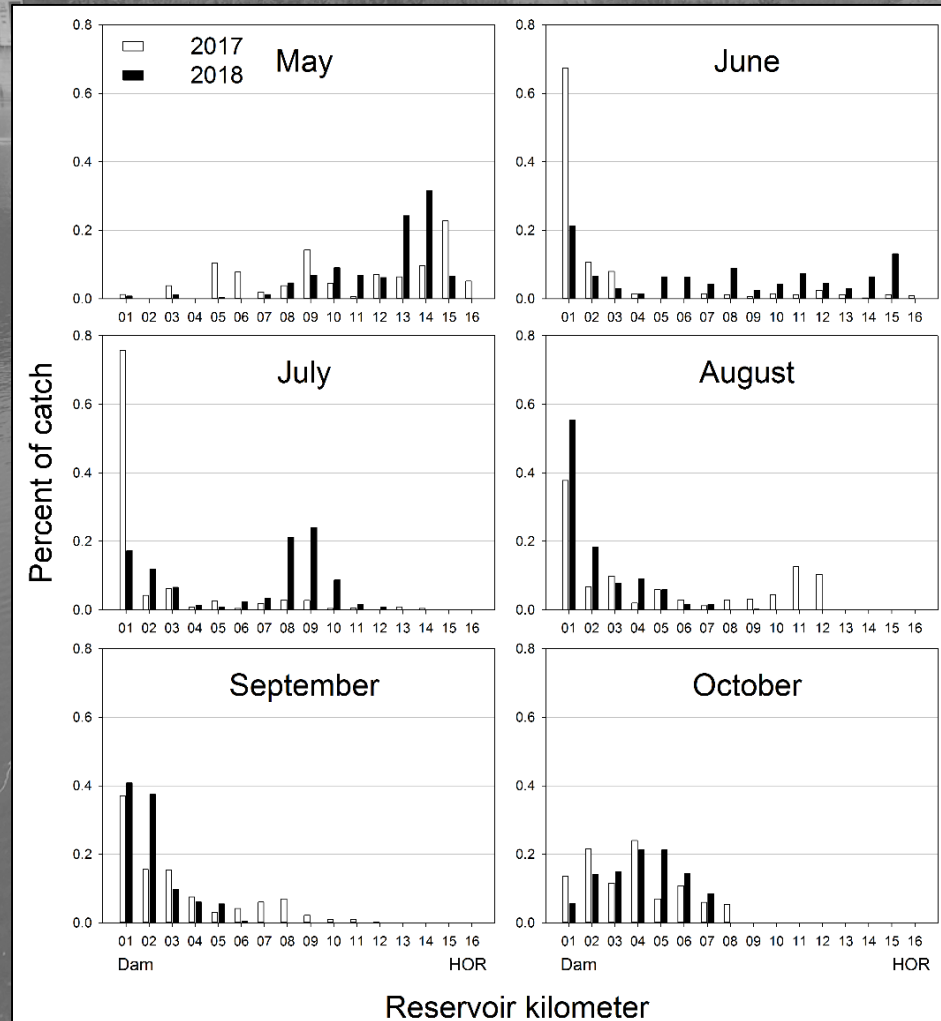
Discharge at Lookout Point Dam



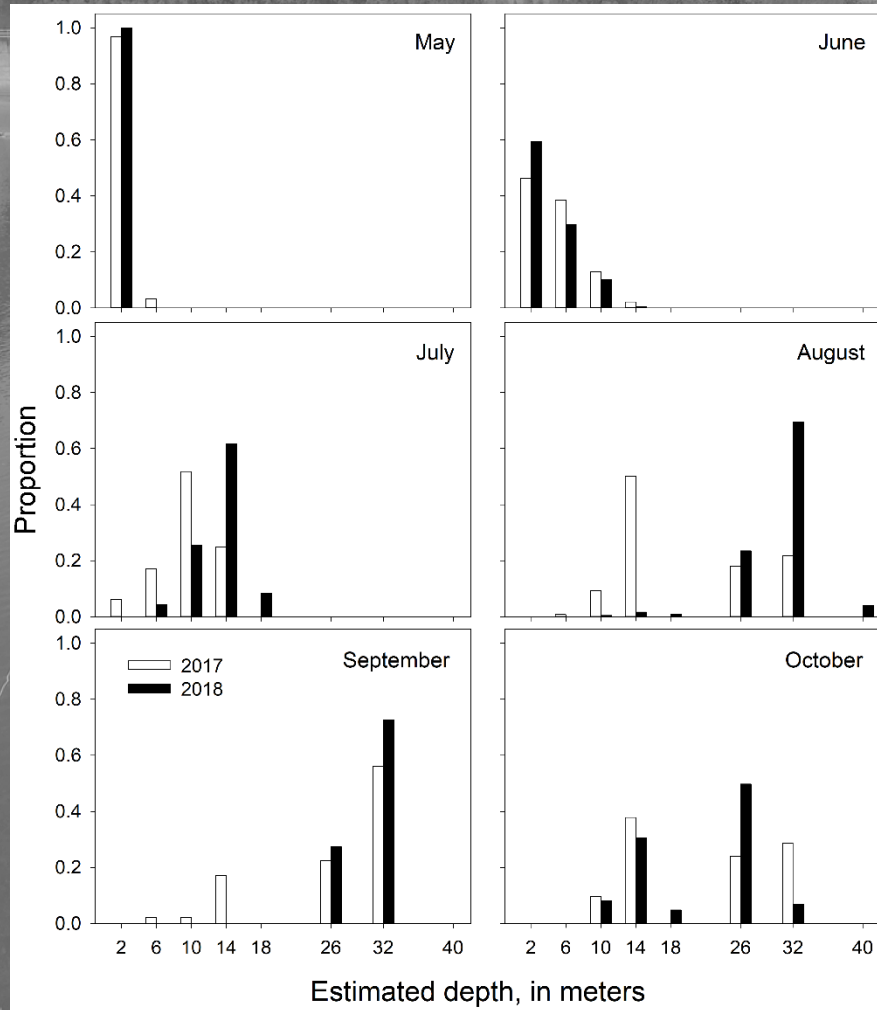
Number of Fish Collected



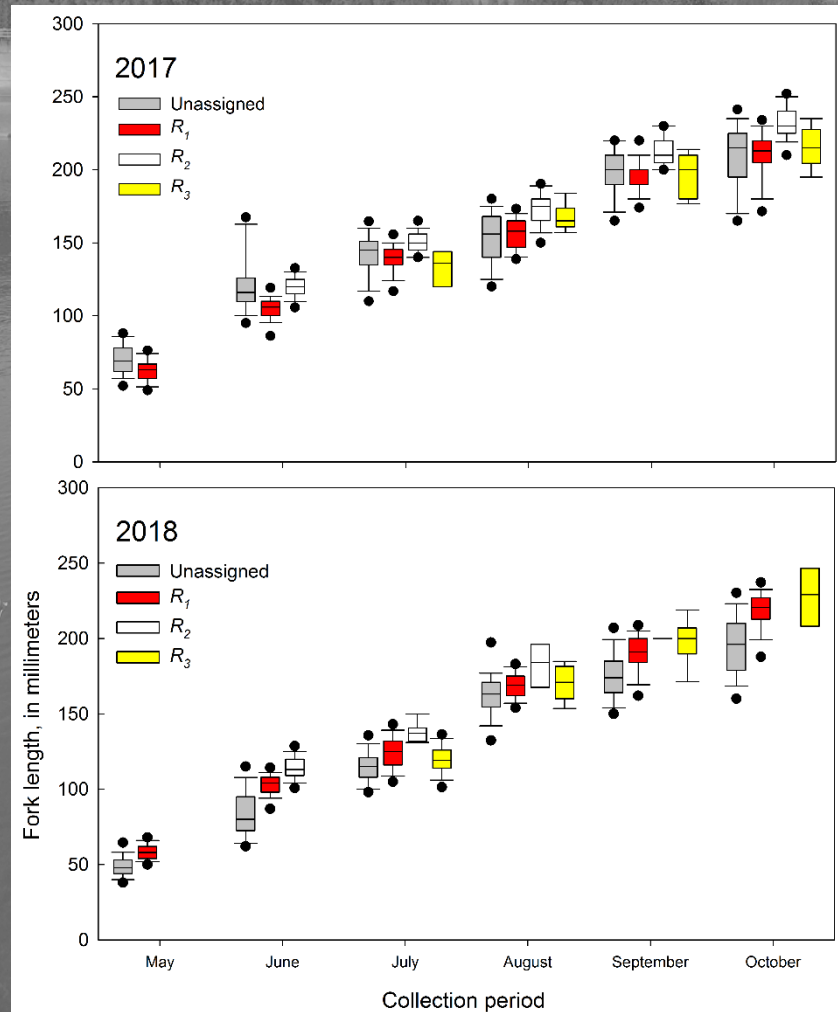
Catch Distribution



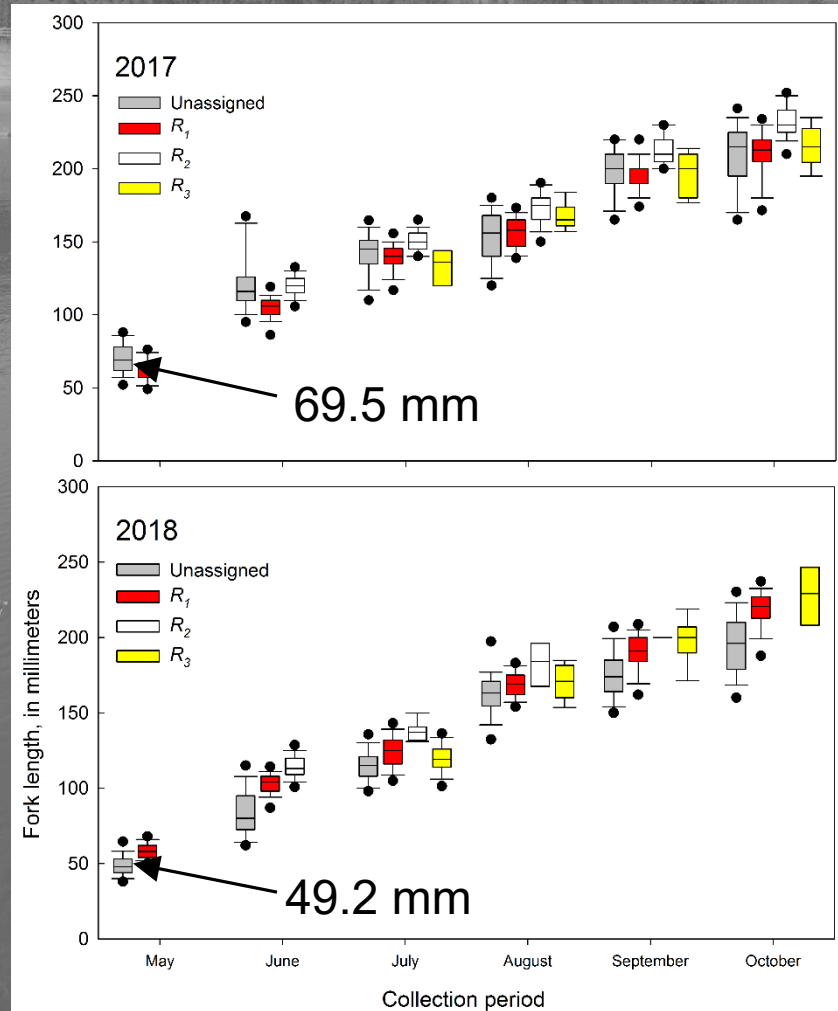
Collection Depth



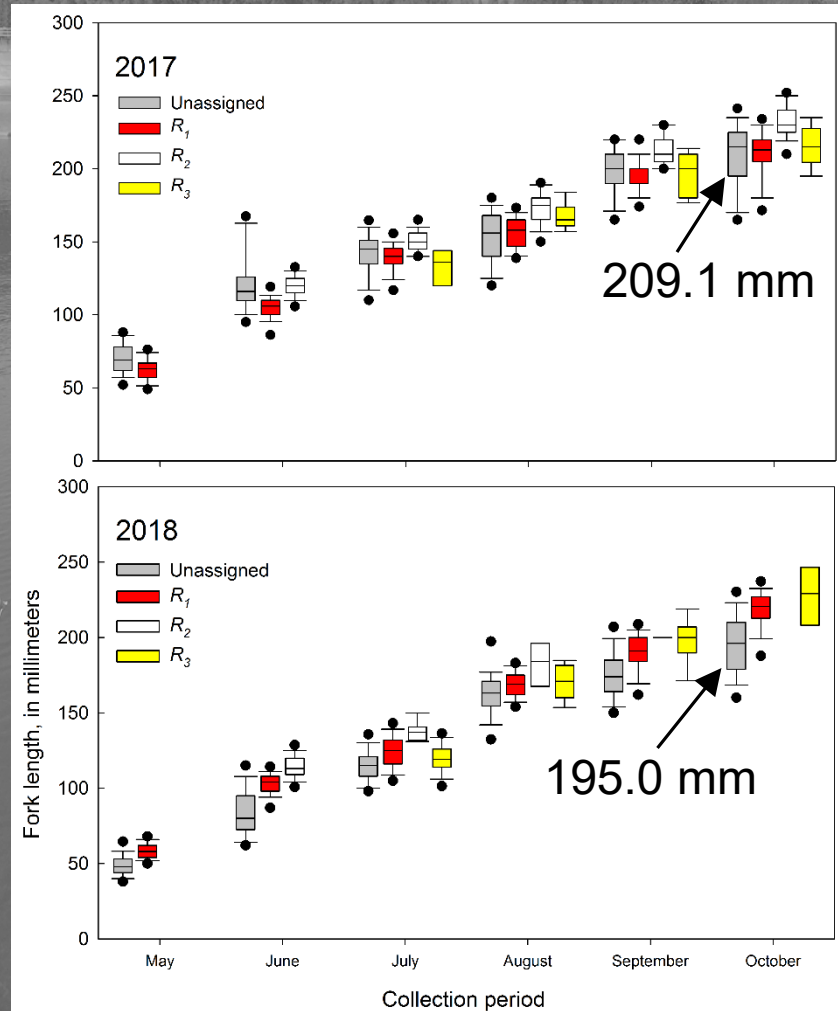
Fish Size by Release Group



Fish Size by Release Group



Fish Size by Release Group



Genetic Results

Year	Total	Unassigned	R1	R2	R3
2017	3,584	2,201 61%	466 13%	881 25%	36 1%
2018	2,957	1,887 64%	951 32%	55 2%	64 2%

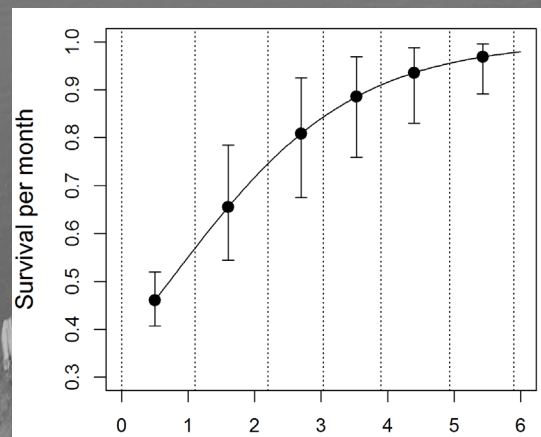
- 92,016 fish released in 2017
- 163,833 fish released in 2018
- Special thanks to Kathleen O'Malley and Sandra Bohn, OSU
 - Genetic and parentage analyses

Staggered Release-Recovery Estimates

Release combination	Period	2017 estimates
R1, R2, R3	April-May	0.646
R1, R2	April-May	0.604
R1, R2, R3	June	0.965
R2, R3	June	0.963
R1, R3	April-June	0.942
R1, R2, R3	April-June	0.623
R1, R2 R2, R3	April-June	0.582

PBT *N*-mixture Estimates

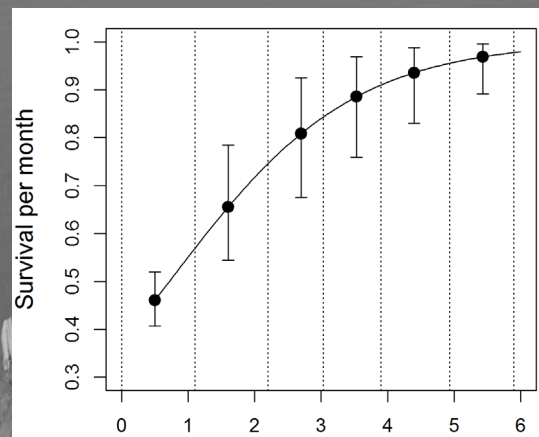
Period	2017 estimates
mid-April to mid-May	0.461
mid-May to mid-June	0.643
Mid-June to mid-July	0.787
Mid-July to mid-August	0.883
Mid-August to mid-September	0.940
Mid-September to mid-October	0.970



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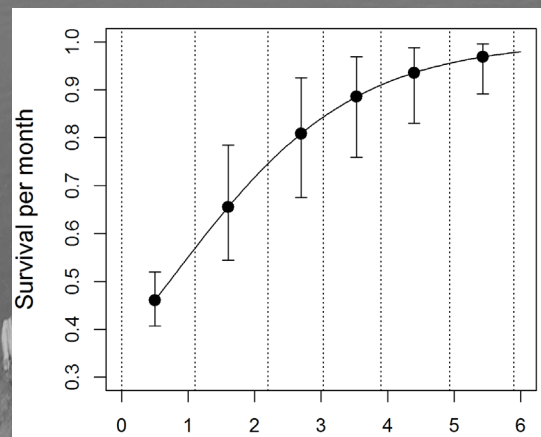
0.296



PBT N-mixture Estimates

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mid-April to mid-May	0.461
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Mid-June to mid-July	0.787
Mid-July to mid-August	0.883
Mid-August to mid-September	0.940
Mid-September to mid-October	0.970

0.188



Reservoir Survival

- 2017 Lookout Point Reservoir

- SRRM: April to June ~ 58-94%
- NMIX: April to June ~ 30%
April to October ~ 19%

- Snake River

- PIT-tagged as subyearlings, detected at dams as yearlings
- 8-33% (Paulsen and Fisher 2001; Levin et al. 2002; Achord et al. 2007)

- Willamette Reservoirs

- Fry released in spring, collected as outmigrants in fall
- Fall Creek Reservoir: 12% (Smith 1976)
20% (Homolka and Smith 1991)
- Green Peter Reservoir: 17% (Wagner and Ingram 1973)
- Blue River Reservoir: 14% (Downey and Smith 1990)

Model Observations

- Staggered Release-Recovery Model

- Fish releases required for each period of interest
- Can be logistically challenging
- Difficult to meet assumptions
- Simple calculations

- PBT N -mixture Model

- Requires 1 fish release
- Survival estimates between sampling occasions
- Data hungry, can deal with very low capture probabilities
- Complex calculations

- 2018 will provide additional insights

- Model performance
 - Fish survival
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Acknowledgments

- Karen Cogliati, Rob Chitwood and staff, Wild Fish Surrogate Program
- Greg Taylor, Todd Pierce and staff, USACE Willamette Valley Project
- Fred Monzyk and Cam Sharpe, ODFW
- Dan Peck and staff, Willamette Hatchery
- Kathleen O'Malley and Sandra Bohn, OSU
- Rich Piaskowski, Scott Fielding and Fenton Khan, USACE Portland District

Copepods

